Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A compound of formula A below, or a pharmaceutically acceptable salt or complex thereof, wherein the compound of formula A comprises

$$\begin{array}{c|c}
R^{1}-R^{2} & & \\
HO & & \\
HO$$

wherein R¹ is selected from azido, amino, substituted amino, hydrazide, semicarbazide, or carbohydrazide;

R² is selected from a saturated or unsaturated carbon chain containing 1 to 25 carbon atoms, or a saturated or unsaturated substituted carbon chain containing 1 to 25 carbon atoms; and

L is selected from O, N, S, P, or an alkylene radical.

- 2. (Original) The compound of claim 1, wherein R^1 is selected from azido, amino or hydrazide; R^2 is a saturated or unsaturated carbon chain containing 5 to 20 carbon atoms; and L is O.
- 3. (Original) The compound of claim 2, wherein the compound is chemically synthesized.

- 4. (Original) The compound of claim 1, wherein L is O.
- 5. (Original) A conjugate comprising the compound of claim 1 and at least one protein carrier, wherein the compound of claim 1 is covalently bound to the protein carrier.
- 6. (Original) A conjugate comprising the compound of claim 2 and at least one protein carrier, wherein the compound of claim 2 is covalently bound to the protein carrier.
- 7. (Original) The conjugate of claim 5, wherein the compound of claim 1 is covalently bound to the protein carrier via the R¹ group.
- 8. (Original) The conjugate of claim 6, wherein the compound of claim 2 is covalently bound to the protein carrier via the R¹ group.
- 9. (Previously presented) The conjugate of claim 5, wherein the protein carrier comprises bovine serum albumin, ovalbumin, keyhole limpet hemocyanin, purified protein derivative of tuberculin, tetanus toxoid, cholera toxoid, diphtheria toxoid, *Pseudomonas aeruginosa* toxoid, *Clostridium* toxoid, Shiga toxin, hepatitis B antigen, or a sequence of amino acids of a *Borrelia burgdorferi* polypeptide.
- 10. (Previously presented) The conjugate of claim 6, wherein the protein carrier comprises bovine serum albumin, ovalbumin, keyhole limpet hemocyanin, purified protein derivative of tuberculin, tetanus toxoid, cholera toxoid, diphtheria toxoid, *Pseudomonas aeruginosa* toxoid, *Clostridium* toxoid, Shiga toxin, hepatitis B antigen, or a sequence of amino acids of a *Borrelia burgdorferi* polypeptide.
- 11. (Original) A method for making the compound of claim 1, wherein R¹ is azido and L is O, the method comprising:

reacting a galactosyl halide with cholesterol to provide a galactosyl-cholesterol; and

reacting an azidoacyl acid with the galactosyl-cholesterol to provide the compound of claim 1.

- 12. (Original) A pharmaceutical composition comprising a therapeutically effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.
- 13. (Original) A pharmaceutical composition comprising a therapeutically effective amount of the compound of claim 2 and a pharmaceutically acceptable carrier.
- 14. (Original) A pharmaceutical composition comprising a therapeutically effective amount of the conjugate of claim 5.
- 15. (Original) A pharmaceutical composition comprising a therapeutically effective amount of the conjugate of claim 6 and a pharmaceutically acceptable carrier.
- 16. (Original) A method of inducing an immune response to *B. burgdorferi* in a subject, comprising administering a therapeutically effective amount of the compound of claim 1 to the subject, thereby inducing the immune response.
- 17. (Original) A method of preventing or treating Lyme disease in a subject, comprising administering to a subject a therapeutically effective amount of the compound of claim 1, thereby preventing or treating Lyme disease in the subject.

Claims 18-31 (Canceled).

- 32. (New) The compound of claim 2, wherein R¹ is azido, and R² is a saturated carbon chain containing 5 to 20 atoms.
- 33. (New) A conjugate comprising the compound of claim 32 and at least one protein carrier, wherein the compound of claim 32 is covalently bound to the protein carrier via the R¹ group.

- 34. (New) The method of claim 16, wherein L is O.
- 35. (New) The method of claim 34, wherein R^1 is selected from azido, amino or hydrazide; and R^2 is a saturated or unsaturated carbon chain containing 5 to 20 carbon atoms.
 - 36. (New) The method of claim 17, wherein L is O.
- 35. (New) The method of claim 35, wherein R¹ is selected from azido, amino or hydrazide; and R² is a saturated or unsaturated carbon chain containing 5 to 20 carbon atoms.
- 36. (New) A compound, or a pharmaceutically acceptable salt or complex thereof, having a structure represented by the formula:

$$H_3C$$
 CH_3
 CH_3

- 37. (New) A conjugate comprising the compound of claim 36 and at least one protein carrier, wherein the compound of claim 36 is covalently bound to the protein carrier.
- 38. (New) A method of inducing an immune response to *B. burgdorferi* in a subject, comprising administering a therapeutically effective amount of the compound of claim 36 to the subject, thereby inducing the immune response.